

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 – 16 (cancelled)

Claim 17 (Currently Amended): A method which may be used to separate propylene from propane from within a gas mixture during the polymerization of polypropylene, said method comprising:

- a) contacting a gas mixture with a first membrane, wherein said gas mixture comprises propylene and propane;
- b) obtaining both a ~~a both~~ propylene-enriched permeate and a propane-enriched retentate through the selective permeation, by said first membrane, of propylene with respect to propane; and
- c) decreasing the propylene concentration of said permeate in said first membrane with a first sweeping gas that comprises ethylene.

Claim 18 (Currently Amended): The method of claim 17, wherein said membrane comprises at least one material selected from the group consisting of:

- a) ~~polymides~~ polyimides;
- b) polyphenylene oxides; and
- c) polymers.

Claim 19 (Cancelled): ~~The method of claim 17, wherein:~~

- ~~a) said method is performed during a polymerization of polypropylene; and~~
- ~~b) said first sweeping gas comprises ethylene.~~

Claim 20 (Cancelled): ~~The method of claim 17, further comprising pretreating said gas mixture prior to said selective permeation, wherein:~~

- ~~—— a) —— said gas mixture further comprises hydrogen; and~~
- ~~—— b) —— said pretreating comprises:~~
 - ~~———— 1) —— contacting said gas mixture with a second membrane; and~~
 - ~~———— 2) —— obtaining a permeate enriched with hydrogen and a retentate enriched with propylene and propane, by a selective permeation with said second membrane.~~

Claim 21 (Currently Amended): The method of claim 33 20, wherein said second membrane comprises at least one material selected from the group consisting of polyamides and polyimides.

Claim 22 (Currently Amended): The method of claim 33 20, further comprising decreasing the hydrogen concentration of said permeate enriched with hydrogen in said second membrane with a second sweeping gas.

Claim 23 (Previously Presented): The method of claim 22, wherein said second sweeping gas comprises nitrogen.

Claim 24 (Previously Presented): A method which may be used for the polymerization of polypropylene, said method comprising:

- a) performing a polymerization of propylene;
- b) recovering an effluent from said polymerization, wherein said effluent comprises:
 - 1) polypropylene;
 - 2) propane; and
 - 3) propylene;
- c) treating said effluent to produce a solid effluent and a gaseous effluent, wherein:

- 1) said solid effluent comprises polypropylene; and
- 2) said gaseous effluent comprises propane and propylene;
- d) treating at least part of said gaseous effluent to separate said propylene from said propane, wherein said treating said gaseous effluent comprises:
 - 1) contacting at least part of said gaseous effluent with a first membrane;
 - 2) obtaining both a propylene-enriched permeate and a propane-enriched retentate, through a selective permeation of propylene with respect to propane, wherein said permeation is carried out by said first membrane; and
 - 3) introducing a first sweeping gas to decrease the propylene concentration of said permeate in said first membrane; and
- e) introducing said propylene-enriched permeate to said polymerization of propylene.

Claim 25 (Previously Presented): The method of claim 24, wherein said first membrane comprises at least one material selected from the group consisting of:

- a) polyimides;
- b) polyphenylene oxides; and
- c) perfluoropolymers.

~~Claim 26 (Cancelled): The method of claim 24, further comprising pretreating said gaseous effluent prior to said selective permeation, wherein:~~

- ~~_____ a) said gaseous effluent further comprises hydrogen; and~~
- ~~_____ b) said pretreating comprises:~~
- ~~_____ 1) contacting said gaseous effluent with a second membrane; and~~
- ~~_____ 2) obtaining a hydrogen enriched permeate and a retentate enriched with propylene and propane, by a selective permeation with said second membrane.~~

Claim 27 (Currently Amended): The method of claim 34 26, wherein said second membrane comprises at least one material selected from the group consisting of polyamides and polyimides.

Claim 28 (Currently Amended): The method of claim 34 26, further comprising decreasing the hydrogen concentration of said hydrogen enriched permeate in said second membrane with a second sweeping gas.

Claim 29 (Previously Presented): The method of claim 28, wherein said second sweeping gas comprises nitrogen.

Claim 30 (Previously Presented): The method of claim 24, wherein said polymerization of polypropylene comprises a copolymerization of polypropylene.

Claim 31 (Previously Presented): The method of claim 30, wherein said first sweeping gas comprises ethylene.

Claim 32 (Previously Presented): The method of claim 24, further comprising mixing said effluent with a second gaseous effluent, wherein said second gaseous effluent is produced by:

- a) performing a copolymerization of polypropylene followed by a recovery of a second effluent, wherein said second effluent comprises polypropylene, propane, and propylene; and
- b) treating said second effluent to produce a second solid effluent and said second gaseous effluent, wherein:
 - 1) said second solid effluent comprises polypropylene; and
 - 2) said second gaseous effluent comprises propane and propylene.

33. (New) A method which may be used to separate propylene from propane from within a gas mixture, said method comprising:

a) contacting a gas mixture comprising propylene, propane and hydrogen with a second membrane and obtaining a permeate enriched with hydrogen and a retentate enriched with propylene and propane, by a selective permeation with said second membrane;

b) contacting the retentate enriched with propylene and propane with a first membrane and obtaining both a propylene-enriched permeate and a propane-enriched retentate through the selective permeation by said first membrane, of propylene with respect to propane; and

c) decreasing the propylene concentration of said propylene-enriched permeate in said first membrane with a first sweeping gas.

34. (New) A method which may be used for the polymerization of polypropylene, said method comprising:

a) performing a polymerization of propylene;

b) recovering an effluent from said polymerization, wherein said effluent comprises:

1) polypropylene;

2) propane; and

3) propylene;

c) treating said effluent to produce a solid effluent and a gaseous effluent, wherein:

1) said solid effluent comprises polypropylene; and

2) said gaseous effluent comprises propane, propylene and hydrogen;

d) subjecting said gaseous effluent to a pretreatment, said pretreatment comprising:

1) contacting said gaseous effluent with a second membrane; and

2) obtaining a permeate enriched with hydrogen and a retentate enriched with propylene and propane, by a selective permeation with said second membrane;

e) treating at least part of said retentate enriched with propylene and propane to separate said propylene from said propane, wherein said treating of said retentate enriched with propylene and propane comprises:

1) contacting at least part of said retentate with propylene and propane with a first membrane;

2) obtaining both a propylene-enriched permeate and a propane-enriched retentate, through a selective permeation of propylene with respect to propane, wherein said permeation is carried out by said first membrane; and

3) introducing a first sweeping gas to decrease the propylene concentration of said permeate in said first membrane; and

f) introducing said propylene-enriched permeate to said polymerization of propylene.